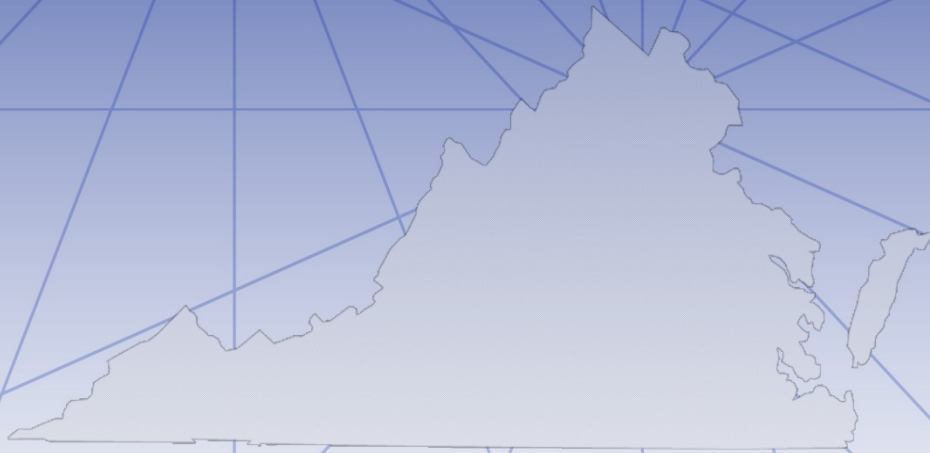


Virginia Information Technologies Agency



Public Safety Call Processing Best Practice



June 2017

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Commonwealth of Virginia

Public Safety Call Processing

Best Practice

This document has been created to serve as a best practice for call processing functions within public safety answering points (PSAP) in the commonwealth. It is an overview of public safety call taking and focuses on the operational aspects of the process, from the answering of the call by a call taker, to the dispatch of emergency services as necessary.

This publication serves as a recommended informational resource for PSAPs.

Development of this document was led by VITA's
Integrated Services Program
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Forward

A best practice is a generally accepted method that, when followed, shows consistent superior results, based on experience and/or research. Best practices should be used as a benchmark by which to maintain quality, and are an alternative to mandatory legislated standards. When developing a best practice, it is important to identify the core principle, purpose and/or goal of the practice, while allowing flexibility for how it is implemented so it remains flexible for a variety of conditions at the local governments. Also, when best practices are considered for implementation on a wide scale, the committee must remain aware of sites with minimal to no resources, and consider how those sites will be supported in order to create the desired outcomes.

This best practices document was developed through a collaborative effort by VITA's Integrated Services Program staff, the Best Practices Steering Committee and applicable workgroups or committees composed of subject matter experts (SME) who have volunteered their time and insights.

These are consensus best practices, and their use is voluntary. Management of PSAPs is a local responsibility. Decisions regarding applicable content and practices, including whether and/or how a Virginia locality should implement this best practice, are strictly local decisions. VITA and the 9-1-1 Services Board assume no responsibility or liability for any such decisions or other use of this document. This best practice is not intended to be an exclusive resource; you should also consider other qualifications, standards, or documents related to this topic. All best practices are subject to change and will be reviewed by ISP staff and/or the BP Steering Committee at least annually following its publication date.

Outside of scheduled review, comments regarding VITA ISP best practices are accepted at any time and can be submitted to Stefanie.McGuffin@vita.virginia.gov. If the comment includes a recommended change, it is requested to accompany the recommendation with supporting material. If you have a question regarding any portion of this best practice, VITA ISP will consider and/or respond to your question in accordance with applicable law, policies, and procedures.

Acknowledgements

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The best practice steering committee served as the workgroup for this document.

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Note : P = Primary; A = Alternate

Abbreviations, Acronyms & Definitions

**Note: A complete listing of 9-1-1 specific definitions can be found on the NENA website and is called the [NENA Master Glossary of 9-1-1 Terminology](#). For the purpose of this best practice the following applies:*

Term	Meaning
9-1-1	A three-digit telephone number to facilitate the reporting of an emergency requiring response by a public safety agency. (NENA Master Glossary of 9-1-1 Terminology NENA-ADM-000.18). Enhanced 9-1-1 (E9-1-1) includes delivery of automatic location information and a call back number.
Automatic Call Distribution	The automatic distribution of incoming calls to available PSAP call takers in the order the calls are received, or the queueing of calls until an attendant becomes available.
Call	A term used to include any type of request for emergency assistance (RFEA) using the digits 9-1-1. This is not limited to voice.
Call Handling or Processing	Done by call taker, it is the process of answering an incoming emergency call and providing the appropriate emergency response.
Call Handling Equipment (CHE)/Customer Premises Equipment (CPE)	Equipment used to process an incoming emergency/non-emergency call. Can be on premises or off-site and includes the console used by call takers to perform the call processing functions.
Call Taker	Person within a Public Safety Answering Point (PSAP) who receives and processes calls. This person may also be known as a telecommunicator or dispatcher.
Next Generation 9-1-1 (NG9-1-1)	NG9-1-1 is an internet protocol (IP) based system comprised of managed emergency services IP networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provides additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communications sources, and provide multimedia data capabilities for Public Safety Answering Points (PSAPs) and other emergency service organizations. (NENA Master Glossary of 9-1-1 Terminology NENA-ADM-000.18).
Public Safety Answering Point (PSAP)	An entity responsible for receiving 9-1-1 calls and processing those calls according to a specific operational policy. In Virginia: <ul style="list-style-type: none"> - A primary PSAP receives landline and wireless 9-1-1 calls directly and is eligible for funding through the PSAP Grant Program. - A secondary PSAP receives transferred calls; not 9-1-1 calls direct.
Rebid	The process of utilizing functionality within the Call Handling Equipment (CHE) to request caller location updates.
Selective Router	The 9-1-1 service provider's physical device that provides switching of 9-1-1 calls and controls delivery of the call to the appropriate PSAP based on the callers' telephone number, location and cross reference to database records. This process is known as selective routing .
Telecommunications Device for the Deaf/Teletypewriter (TDD/TTY)	A device that uses Baudot Code representing text, numbers, punctuation and control signals, to place and transmit calls and communications over phone lines.
Trunk	Typically, a communication path between central office switches, or between the 9-1-1 Control Office and the PSAP. (NENA Master Glossary of 9-1-1 Terminology NENA-ADM-000.18).

Chapter 1: Introduction

This best practice has been developed to support and/or strengthen the call processing functions, herein referred to as call processing, at public safety answering points (PSAP) in the commonwealth. Use of this best practice promotes the standardization of call processing among jurisdictions and provides consistency in the handling of all calls across Virginia, thus improving service delivery. Using the best practices contained in this guide, and other documents and standards cited within, PSAPs should develop, document, and continuously train on and refine, all processes and procedures to specifically meet the needs of their environment and operations.

The origin of receiving emergency calls on a standard telephone line has undergone a dramatic evolution. It has grown from basic 9-1-1, to enhanced 9-1-1 (E9-1-1), and continues to transform toward next generation 9-1-1 (NG9-1-1). The increased complexity of communications systems makes it necessary for the parallel advancement of standards and procedures. Agencies and associations such as the Federal Communications Commission (FCC), the National 911 Office, the Association of Public-Safety Communications Officials (APCO), and the National Emergency Number Association (NENA) provide standards and guidelines that directors and 911 operation managers are recommended to follow. When a call is received, the subsequent process by which call takers execute a response may be enhanced by the recommendations contained in this document. Regardless of the technology in place, the call takers must perform their duties in the most efficient and professional manner possible, as they are the first of the first responders.

Chapter 2: Call Delivery

In the commonwealth, 9-1-1 calls for service are passed through telephone company selective routers and sent to the appropriate PSAP. To ensure diversity and redundancy in the system, should a failure occur, each PSAP should be served with a minimum of two wireline and two wireless 9-1-1 telephone trunks from two diverse selective routers.¹

To help assure availability of trunk lines and delivery of calls, it is recommended that calls by type, wireline and wireless, be delivered to the PSAP on separate dedicated trunk lines. This is done so calls of a specific type, typically wireless, are not able to overwhelm all trunks in the event of a large number of calls being received at once (i.e. traffic crash on an interstate highway).

The number of trunks in a PSAP will be agency-specific based on analysis of the number of call-taking positions, staffing on duty and weekly/monthly/annual and peak hour call volumes. Each year, the PSAPs should work with their Local Exchange Carrier (LEC) to have a traffic study conducted and analyzed. A study of this nature reports on various elements including calls receiving a busy signal, lost and overflow calls, hold times and minutes used. A traffic study and traffic measurement report (TMR) is

¹ There are currently a few PSAPs in the commonwealth receiving call delivery via Internet Protocol IP and may have a different configuration. The architecture of call delivery will transition as the implementation of Next Generation 9-1-1 occurs across the Commonwealth.

intended to assist with the designing and administering of communications activities associated with telephone service and when analyzed, can help determine that the appropriate number of trunks are in place to allow for optimum delivery of 9-1-1 calls for service.

Chapter 3: Disaster Recovery Planning

It is recommended that each PSAP in Virginia engage their Local Exchange Carrier (LEC) to develop and complete a disaster recovery plan. The plan will include procedures each party is to follow in the event of a failure/outage or disaster involving the communications system or facility. Once the plan is established, the LEC and the PSAP should test the plan annually through a disaster testing exercise. This will assure that all scenarios, roles, responsibilities and processes are clearly defined, documented and executable. All PSAP leaders should become involved in and be knowledgeable of their networks and configurations. Understanding how the network operates within your PSAP will be a major asset in the event of a disaster.

As an additional resource, NENA offers courses in disaster planning for PSAPs. More information about those courses should be reviewed at the following link:

<http://www.nena.org/?page=DisasterPlanCourse>. For resources regarding overall disaster and continuity of operations (COOP) planning, PSAPs should refer to the Virginia Department of Emergency Management(VDEM).

Chapter 4: Call Distribution

4.1 First Available

Once a call is received by the PSAP, decisions regarding how calls will be delivered to and answered by the call takers must be made. Calls are typically answered by the first available call taker following an established answering priority (see Answering Priority below). Establishing a policy regarding who (call taker, dispatcher, supervisor, etc.) is responsible to answer specific types of calls, is also advisable.

In some PSAPs, dedicated call takers are not always available as they act in multiple roles (radio operator, call taker, VCIN operator, etc.). In the event of incoming 9-1-1 calls with no dedicated call taker available, the PSAP must have a process in place designating available personnel to answer calls.

4.2 Automatic Call Distribution

PSAPs should consider implementing an automatic call distribution (ACD) method. The ACD system allows calls to be equally distributed among available call takers, thus achieving a balance of workload. This type of methodology is more compatible in a high call volume PSAP and should help achieve call handling efficiency in that hectic environment. PSAP managers should work to understand how ACD functions and what equipment or processes must be in place, and should determine if it's implementation is suitable to their operational environment.

Chapter 5: Call Answering

5.1 Standard Call to Answer Time

Every PSAP in the commonwealth should meet the current National Emergency Number Association standard for answering 9-1-1 calls.² At present, this standard states that ninety percent (90%) of all 9-1-1 calls arriving at the PSAP shall be answered within ten (10) seconds during the busy hour, and that ninety-five percent (95%) of all 9-1-1 calls should be answered within twenty (20) seconds.³

5.2 Answering Priority

All calls for service received should be answered in priority order as follows:

- The first priority is the 9-1-1 emergency line and text-to-9-1-1
- Second priority is emergency 7-/10-digit phone lines
- Third priority are the non-emergency lines
- Fourth in priority are the administrative and/or internal phone lines

5.3 Answering Language/Protocol – 9-1-1 Lines

All calls will be answered with “9-1-1”. It is further recommended that the following additional language be included, “What is the address of your emergency?”, or “Where is your emergency?”. In addition, an agency may include their name when answering. Suggested language follows, “<agency name>, 9-1-1. Where is your emergency?”

5.4 Answering Language/Protocol – Non-emergency Lines

A standard answering language should be developed and implemented for the answering of non-emergency lines within the PSAP. Part of this protocol should include clear identification of the agency name. The inclusion of a call taker’s name and/or identification number is at the discretion of the agency.

5.5 Address/Location Verification

Using local protocols, training, and available resources, an address of the incident should be obtained with as much detail as possible. If the call is a wireline 9-1-1 call, the address information presented with the ALI is to be verified with the caller. If a wireless 9-1-1 call is received, the call taker will use the information provided on the screen to determine the class of service of the call: wireless phase 1 (WPH1), wireless phase 2 (WPH2) or a voice over internet protocol (VOIP). If the call presents as WPH1, it should be rebid after 20 seconds, so Phase 2 location information can be captured. Depending on the length of the call, a rebid to determine accurate location may need to occur several times, particularly if the wireless 9-1-1 caller is moving. Most call handling equipment can be configured to automatically rebid at set time intervals. PSAPs should evaluate the ability of their system to perform this feature and should consider implementing the automatic rebid

² This NENA standard is currently undergoing an update and should be released around the second quarter of 2017. Once published PSAPs should follow the new NENA standard.

³ NENA Call Taking Operational Standards/Model Recommendation. NENA 56-005. June 10, 2006.

function. Call takers should always keep in mind that the location information displaying on their screen may be inaccurate for many reasons; therefore, location of the incident should always be verified with the caller.

Chapter 6: Call Processing / Communication with Caller

The call taker will begin by gathering basic information from the caller. This includes the address or location of the incident, the type of emergency, obtaining and/or verifying a call back number, a time of the occurrence, and any known potential hazards. Other information deemed necessary through local protocol/training, or the order of information gathering, may vary among PSAPs but should contain, at a minimum, the information listed above.

As basic information is gathered, including location and type of emergency, dispatch of appropriate emergency service should be initiated. Each PSAP should have an established policy for call processing based on the nature of the call. The policy should include what information needs to be gathered based on call type, as well as specifics regarding processing procedures, call taker judgement, call termination, reporting and etc.

6.1 Emergency Medical Dispatch

Emergency medical dispatch (EMD) is a system that enhances services provided by PSAP call takers by allowing them to narrow down the caller's type of medical or trauma situation, so they can better dispatch emergency services and provide pre-arrival medical instruction to the caller. Due to the highly effective, life-saving success of EMD, each PSAP in Virginia should have an established EMD protocol in place, and have call takers certified on the system. The Virginia Department of Health's Office of Emergency Medical Services offers assistance establishing EMD programs and has additional EMD resource information on their website at the following link:

<http://www.vdh.virginia.gov/OEMS/PSAP/>

Chapter 7: Emergency Call Transfer

7.1 Transfer of Emergency 9-1-1 Calls

If an emergency call is received by a PSAP and must be transferred to another PSAP, it should be done so without delay. In an emergency, a call taker should not provide a number to the caller and advise them to call themselves. Each PSAP in Virginia should work with their equipment maintenance provider to assure they have programmed into their telephone consoles, the 9-1-1 direct or emergency 10-digit number for at least each adjacent locality's PSAP. This should allow for a "one-button transfer". All other agencies frequently transferred to, (e.g., Virginia State Police, poison control centers, sheriff's offices, etc.) should also be programmed for "one-button transfer". Emergency 10-digit phone numbers for agencies that are farther away should be kept in a PSAP's call list.

When transferring an emergency call, the telecommunicator should advise the caller to stay on the line while they connect them to the < state appropriate agency name>. The telecommunicator should stay on the line until the connection is complete and all pertinent information, as determined by the PSAP, has been relayed. Blind transfers (when the call is sent to another location and the initial call taker drops off before connection is complete and information relayed) of emergency calls should never occur.

7.2 Transfer of Non-Emergency Calls

If a non-emergency call is received by the PSAP on the 9-1-1 line and needs to be transferred, the call taker should not transfer the call (e.g., a caller reporting stolen property needs to speak to law enforcement). Transferring a call that came in on a 9-1-1 line to a non-emergency number will most often hold the trunk in busy status. The caller should be given the appropriate non-emergency number to call to report the incident.

PSAPs may consider transferring a non-emergency call as good customer service if current call volumes are low.

Chapter 8: Telematics and Alarms

Telematics and alarm calls for service should be treated like other emergency calls and should follow the same appropriate processing. They typically arrive at the PSAP over a 10-digit phone line. It is a best practice for the PSAP to have a 10-digit phone number/line dedicated for telematics and alarms. This allows the call taker to know the nature of the incoming call, that it should be treated as emergency and answered in the appropriate priority. If calls of this type are not received on a dedicated 10-digit line, it is impossible to distinguish them from non-emergency calls.

Chapter 9: Text-to-911

Within Virginia, it is the goal to ensure that Text-to-9-1-1 service is available universally throughout the state. The following best practices are encouraged:

- Encourage the pursuit of web browser Text-to-9-1-1 solutions, or Direct IP solutions where and when available.
- Leverage text aggregator solutions for statewide deployment.
- Integrate statewide deployment of Text to 9-1-1 with NG9-1-1.

Additional resources regarding appropriate steps for deploying text to 9-1-1 within the commonwealth can be found on the VITA ISP website, at the following web address:

<http://www.vita.virginia.gov/isp/default.aspx?id=6442473870>

In Virginia, the minimum geographical boundary for text-to-9-1-1 deployments will be at the PSAP level since individual PSAPs cover both cities and counties. Although the unit of deployment for text-to-9-1-1 is a single PSAP and a single wireless carrier at a time, current text-to-9-1-1 solutions can support regional and even state-wide deployments. PSAPs wanting to deploy text-to-9-1-1 should develop and

carry out a proactive public education campaign. The public should be advised to utilize text, only when a voice call is not possible or advisable. ⁴

Chapter 10: Non-standard Calls⁵

There are often calls received by a PSAP that are non-standard, meaning that the nature of the call cannot easily be determined. Detailed procedures for handling these types of calls should be established by the PSAPs and followed by call takers. In many cases, determining how to handle/process non-standard calls will rely on judgment of the call taker. When applicable, call takers should listen for background sounds, tone of caller, word choice, any possible location clues, etc. to help determine the nature of the call and if emergency dispatch is warranted. Some general best practices for handling certain non-standard calls follows.

10.1 Abandoned Calls or Disconnects

When a 9-1-1 call is received and is abandoned or disconnected before appropriate response can be determined, the call taker will attempt a call back. If an answering machine is reached, a message should be left. If location information is received, the caller cannot be reached by call back, and the call taker has reason to believe dispatch is warranted, law enforcement should be dispatched. If the call was from a wireless device, at least one call back should be attempted.

If a high abandoned call event occurs, i.e. a spawned calls attack or other technological event, PSAPs should consider having a call taker dedicated to receiving and investigating these events and to performing call-backs.

10.2 Silent Calls

All silent calls received should be responded to with a TDD/TTY challenge to determine if the caller is attempting to reach 9-1-1 with a communications device for hearing impaired individuals. If contact is made, established call processing procedures should be followed. If it is determined that a TDD/TTY device was not used, call takers should follow the procedure for abandoned calls or disconnects.

10.3 Misdials

A call is determined to be a misdial if the caller stays on the line and admits to the misdial. Call takers should continue to verify the information from the caller for accuracy. Any concern of the call taker should initiate the appropriate, agency defined, emergency response.

⁴ Commonwealth of Virginia Text-to-9-1-1 Whitepaper. -911 Services Board. January 8, 2015.
http://vita.virginia.gov/uploadedFiles/VITA_Main_Public/ISP/E-911/2015/WPFINV3.pdf

⁵ While calls in this category are common occurrences in the PSAP, the term non-standard calls is being used to align with the NENA 9-1-1 Call Processing standard.

10.4 Unintentional Calls

A call is classified as unintentional when the call taker can hear conversation, non-suspicious background noise, and have listened sufficiently and checked with a TTY/TDD to determine that there is no indication of an emergency situation.

10.5 Prank Calls

Call takers will call back a suspected prank caller. Prank calls should be treated as a real emergency until proven otherwise. The called party will be questioned to determine if further action is needed or a response is required based on agency procedures and/or protocols.

10.6 TDD/TTY

Pursuant to that applicable portion of Title II regulation of the Americans with Disabilities Act (§ 35.162)⁶, “Telephone emergency services, including 911 services, shall provide direct access to individuals who use TDDs and computer modems.” As such, A TDD/TTY device must be located and functioning correctly in each PSAP. Testing of this equipment should occur at least monthly. After answering an incoming 9-1-1 call, if the call taker determines the line to be silent or open but they cannot establish voice communication, they should immediately initiate a TDD/TTY call response. Likewise, if a call taker hears a voice generated message advising that the incoming call is TTY/TDD they should initiate TDD/TTY response immediately. Call takers should be trained on the use of TDD/TTY device and proper response etiquette as outlined in the [NENA TDD/TTY Communications Standard, NENA 56-004](#), June 25, 2005. Refresher training should be provided to all call takers annually. For training standards please refer to the [APCO/NENA ANS 3.105.1-2015. Minimum Training Standard for TDD/TTY Use in the Public Safety Communications Center](#).

Chapter 11: Error Reporting and Correction and Quality Assurance Program

An error reporting and correction process and/or a quality assurance (QA) program should be established at every PSAP. Many types of “errors” can occur during the process of a 9-1-1 call. Some of those may be receiving incomplete or no data including an ALI failure and/or an ANI failure, incorrect ALI and/or ANI information, mapping interface failures or inaccuracies, equipment problems, etc. A detailed error report for each type of incident should be developed and utilized within the PSAP. Along with the reports each PSAP should develop a quality improvement program/procedure for identifying, reporting on and correcting errors. The procedure should detail staff roles and responsibilities, timeframes, and resolution reporting, so all staff are aware of issues and outcomes. Once errors are corrected an attempt to recreate the error should occur to insure the correction was successful.

⁶ Text of Title II can be found at the following website:
https://www.ada.gov/regs2010/titleII_2010/titleII_2010_regulations.htm#a35162

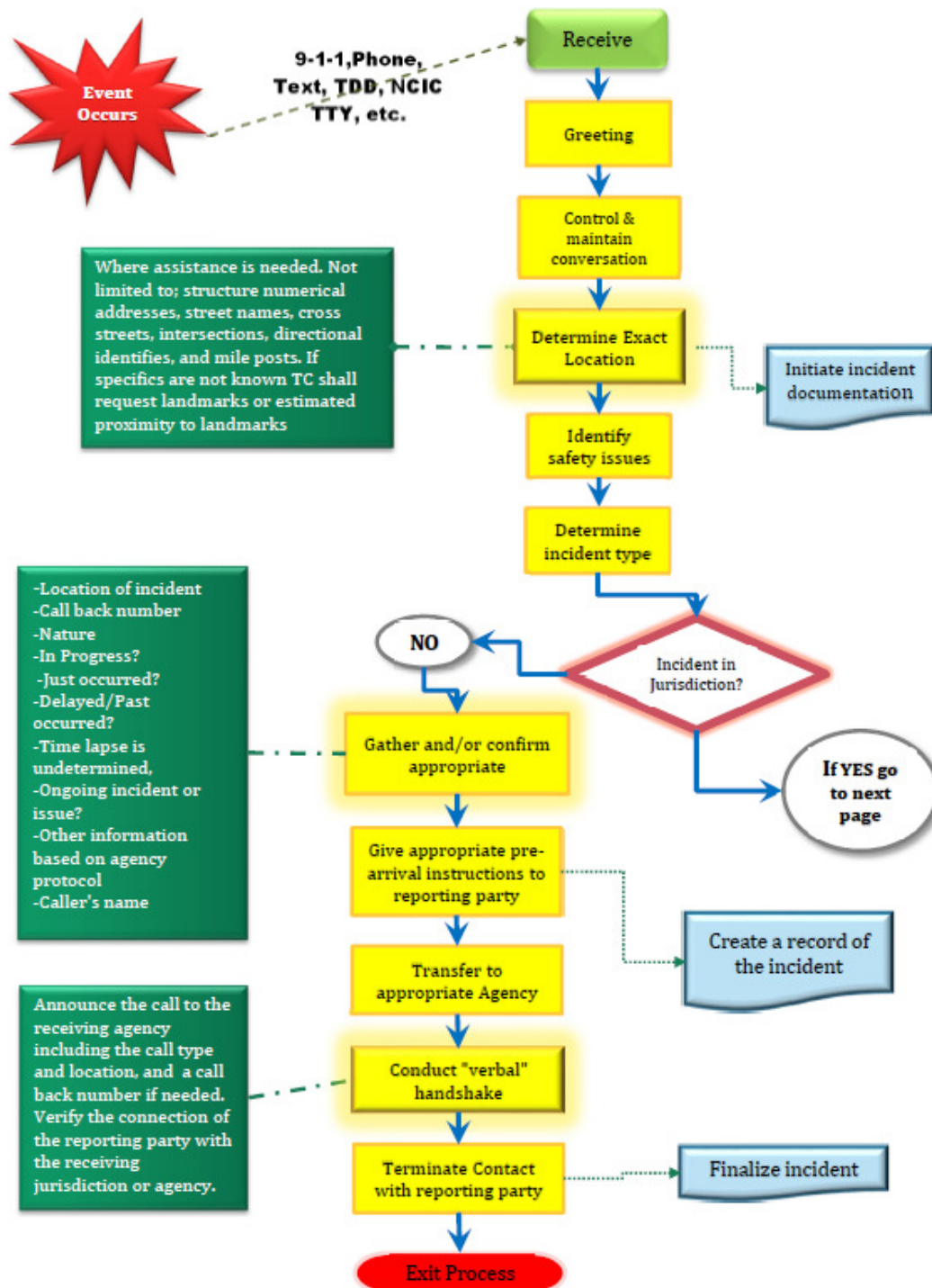
Further information regarding the establishment of a QA Program refer to the [APCO/NENA ANS1/107/1/2015](#) Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points.

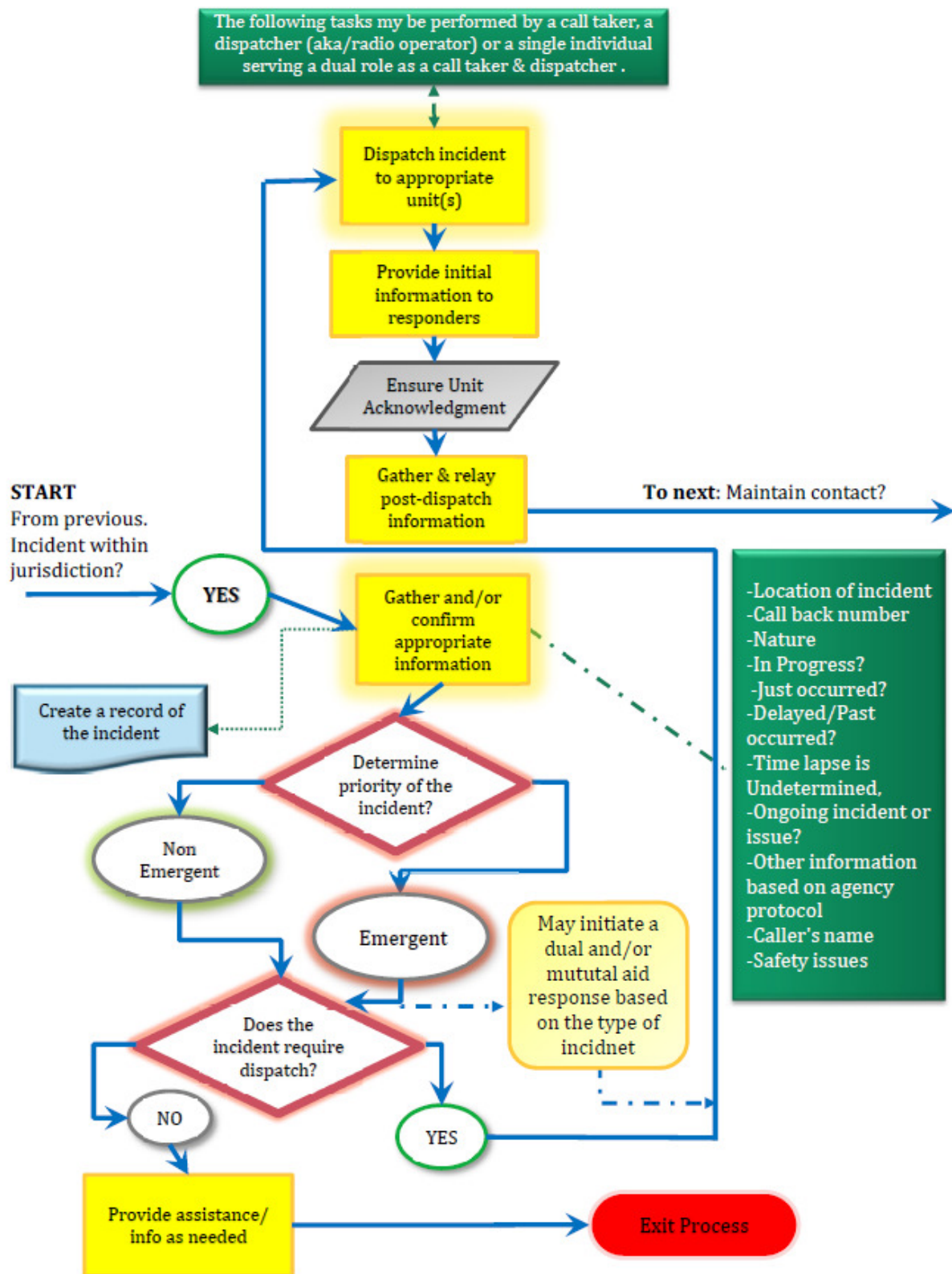
Conclusion

9-1-1 call handling is a complex practice that requires dedicated, highly trained and effective personnel. Establishing detailed call processing procedures, and carrying out training on those procedures, should be an achieved goal of every PSAP in the commonwealth. The best practices included in this document should be incorporated into local policies and procedures as warranted.

Additional Resources

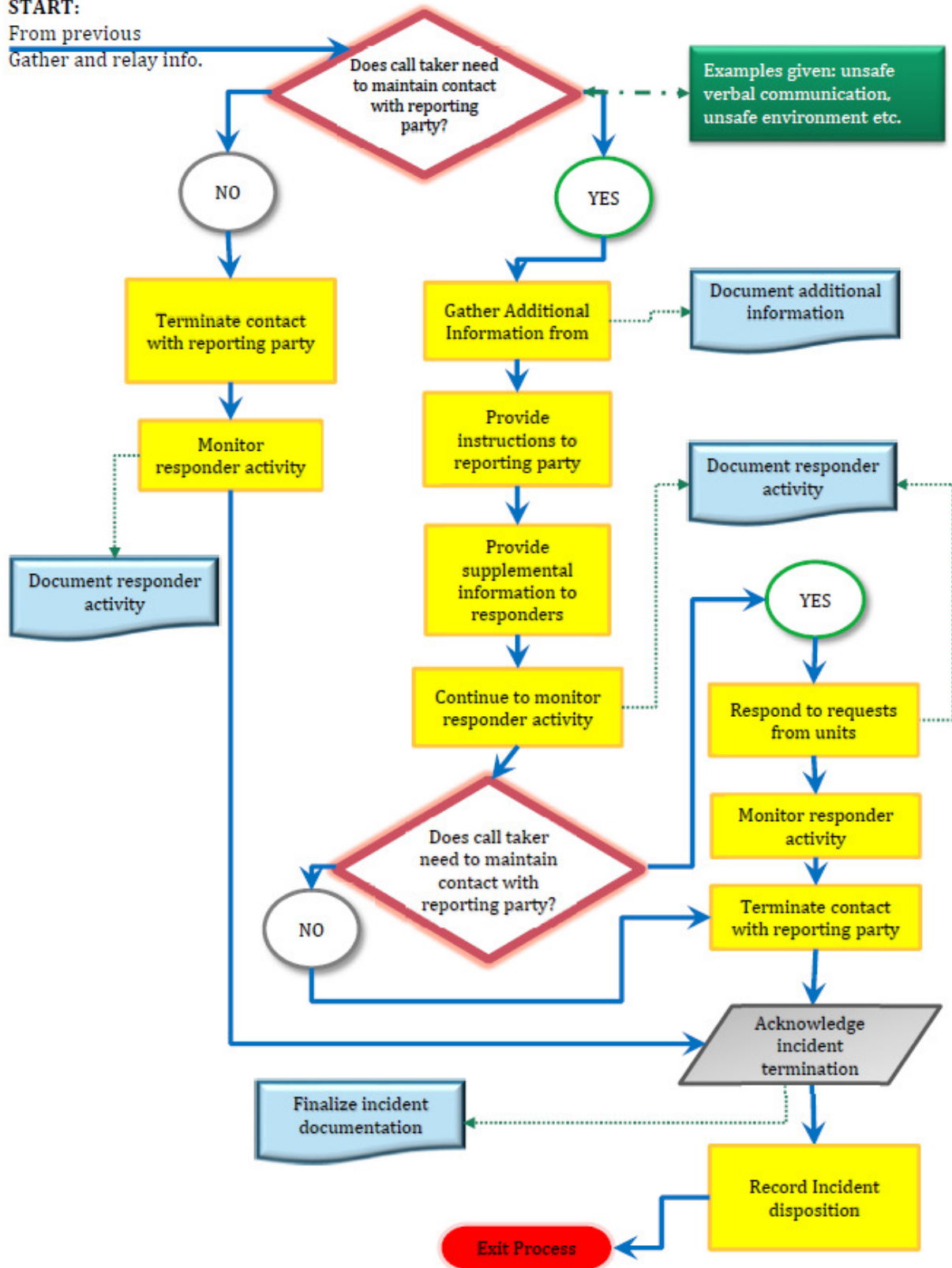
The Best Practice Steering Committee recommends the following as a guideline PSAPs can follow in call processing. This is a process analysis flow chart developed by the Association of Public Safety Communications Officials (APCO) in 2015.





START:

From previous
Gather and relay info.



<i>Version</i>	<i>Summary</i>	<i>Date</i>
1.0	Initial BP documents developed by the ISP staff, presented to PSAP community through a webinar and discussed with the BP Steering Committee. Document in draft.	1/1/2016
1.1	Annual review of document. Modifications include suggestions of reviewers and other updates including changing the title by replacing the word Handling with Processing and placing the document in the approved template.	2/1/2017
2.0	Document as accepted by the BP Steering Committee and 9-1-1 Services Board.	5/31/2017